Defense & Space Systems
Teterboro, New Jersey

AVIONICS SYSTEM INTEGRATOR

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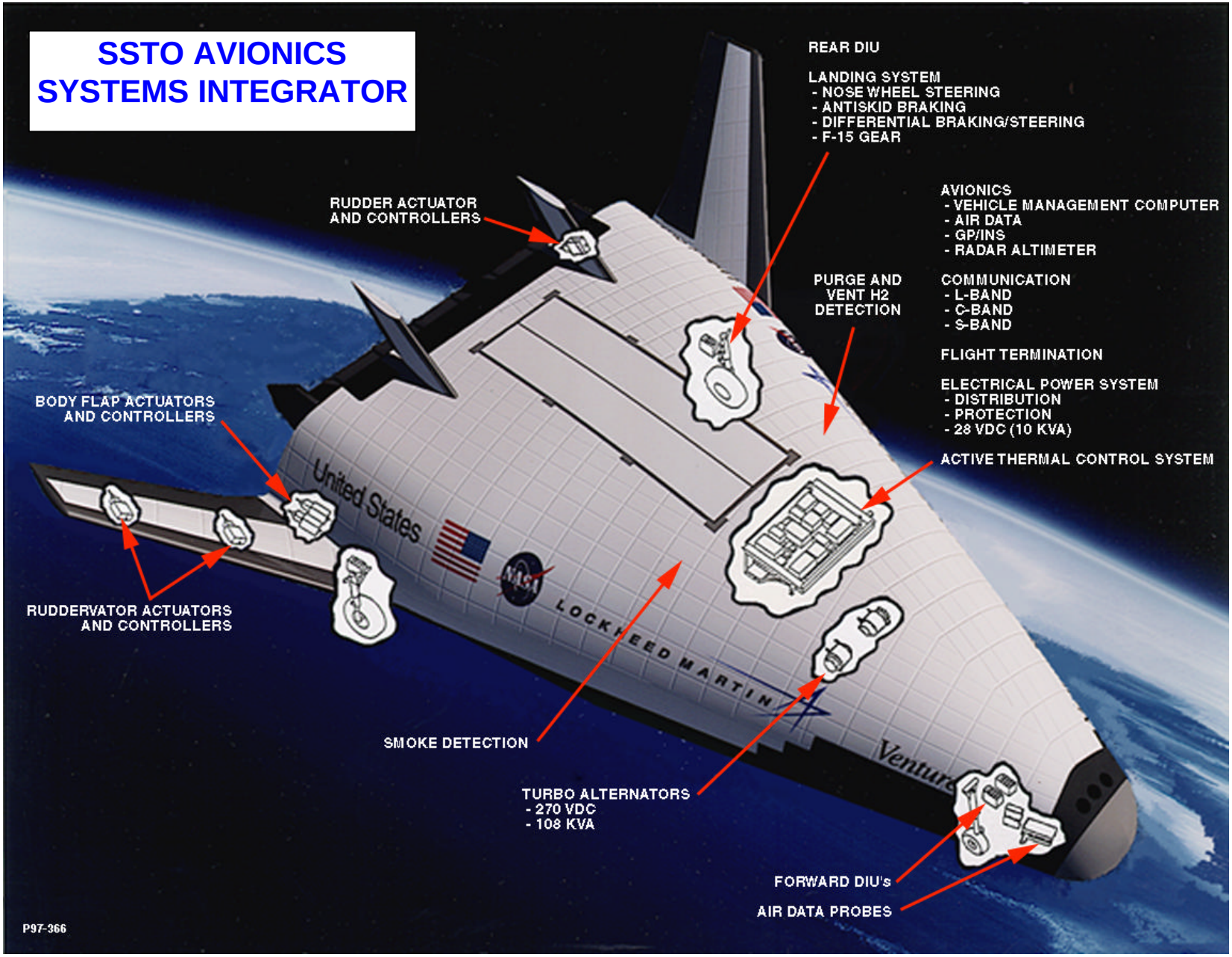
Teterboro, New Jersey

FOR MORE INFORMATION PLEASE CONTACT
PAUL MAKUS, BUSINESS DEVELOPMENT
MANAGER, AT 201-393-3060



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The AlliedSignal Aerospace SSTO Integration Team

❑ Electronic Systems - Based in Teterboro, New Jersey

- **Team Leader, Program Management and Systems Engineering**
- **Integrate a Variety of Equipment as Part of the VMS**
- **Provide Telemetry and Tracking, System Software, Flight Control Systems and Navigation and Electrical Ground Support Equipment**

❑ Aerospace Equipment Systems - Based in Torrance California

- **Vehicle's Mechanical Subsystems, Including Power Generation and Control Systems, Environmental Controls to Cool Avionics and Provide Fresh Cabin Air, the Fire Detection Systems, and the Landing and Braking System**

❑ Technical Services Corp. - Based in Columbia, Maryland

- **Development of Launch Control Systems and Mission Planning Support**

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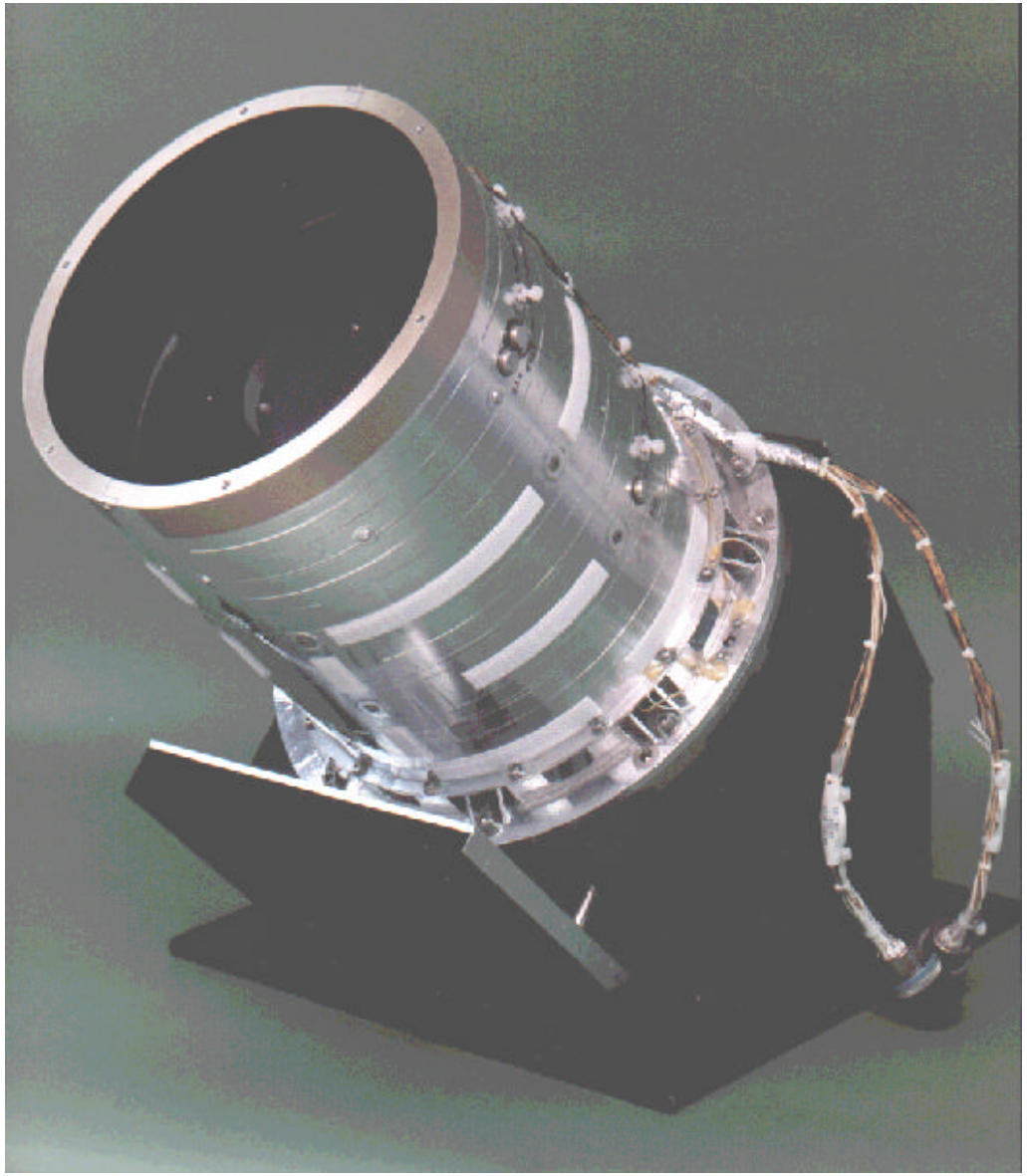
NGST STAR SENSOR DESIGN APPROACH



- SYSTEM POWER: <40 WATTS
- SYSTEM WEIGHT: < 30 LBS
- BORESIGHT STABILITY
  - 0.10 ARCSEC OVER 20 MINUTES
  - 0.24 ARCSEC OVER 21 DAYS

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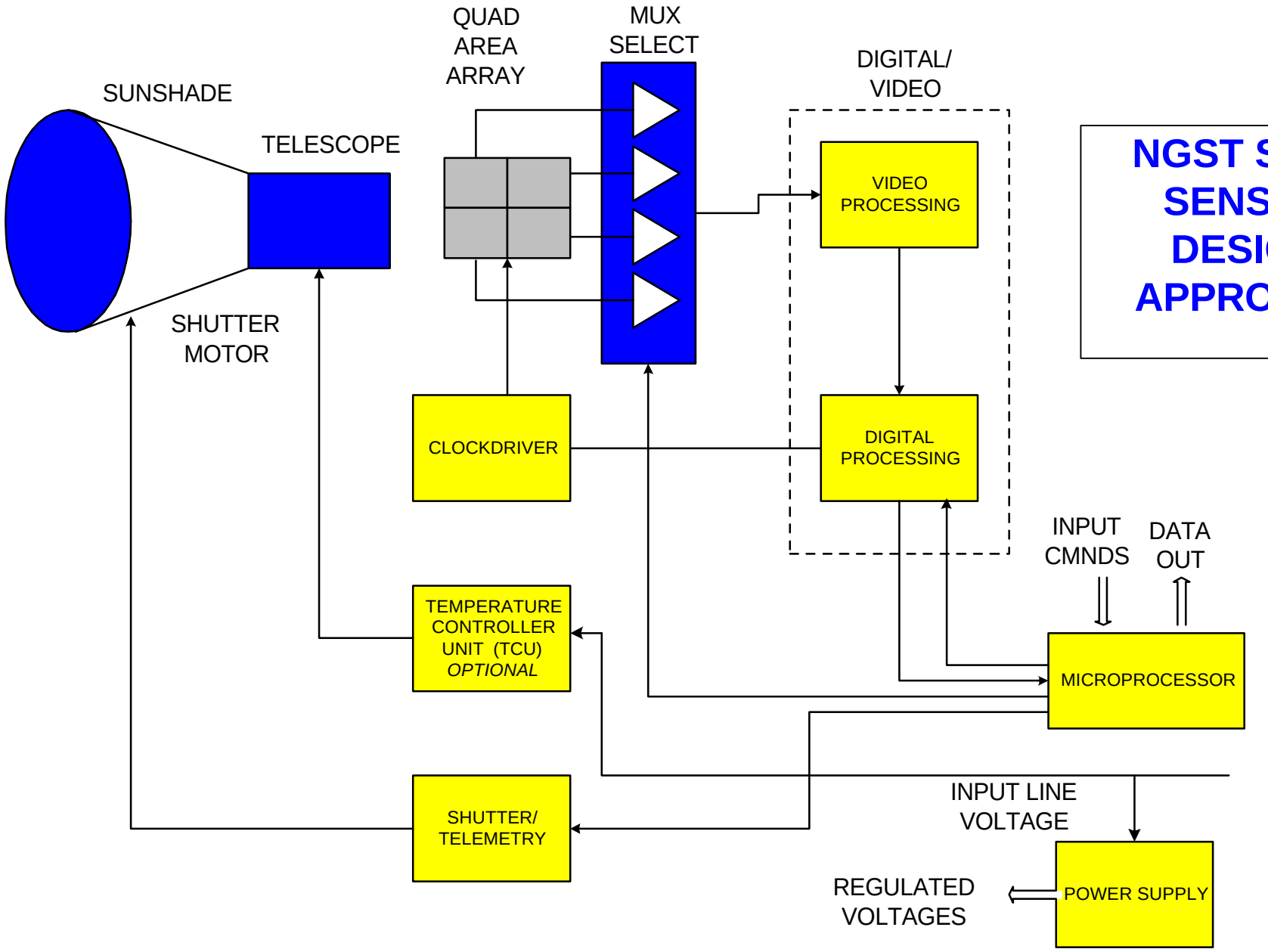

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AREA ARRAY STAR SENSOR
RANDOM ERROR PREDICTIONS

STAR RANK	1.5 DEG/SEC	3.0 DEG/SEC	4.0 DEG/SEC	6.0 DEG/SEC	8.0 DEG/SEC
600	0.07/0.07	0.08/0.09	0.08/0.10	0.10/0.14	0.13/0.17
1000	0.07/0.08	0.09/0.12	0.11/0.15	0.15/0.21	
1500	0.08/0.10	0.12/0.16	0.14/0.20		
1900	0.09/0.11	0.13/0.19			
2400	0.10/0.13	0.16/0.23			BEGIN OF LIFE/ END OF LIFE

NOTE: ALL ERRORS ARE 1 SIGMA CIRCULAR ERRORS IN ARCSECONDS

AT A 2HZ UPDATE RATE

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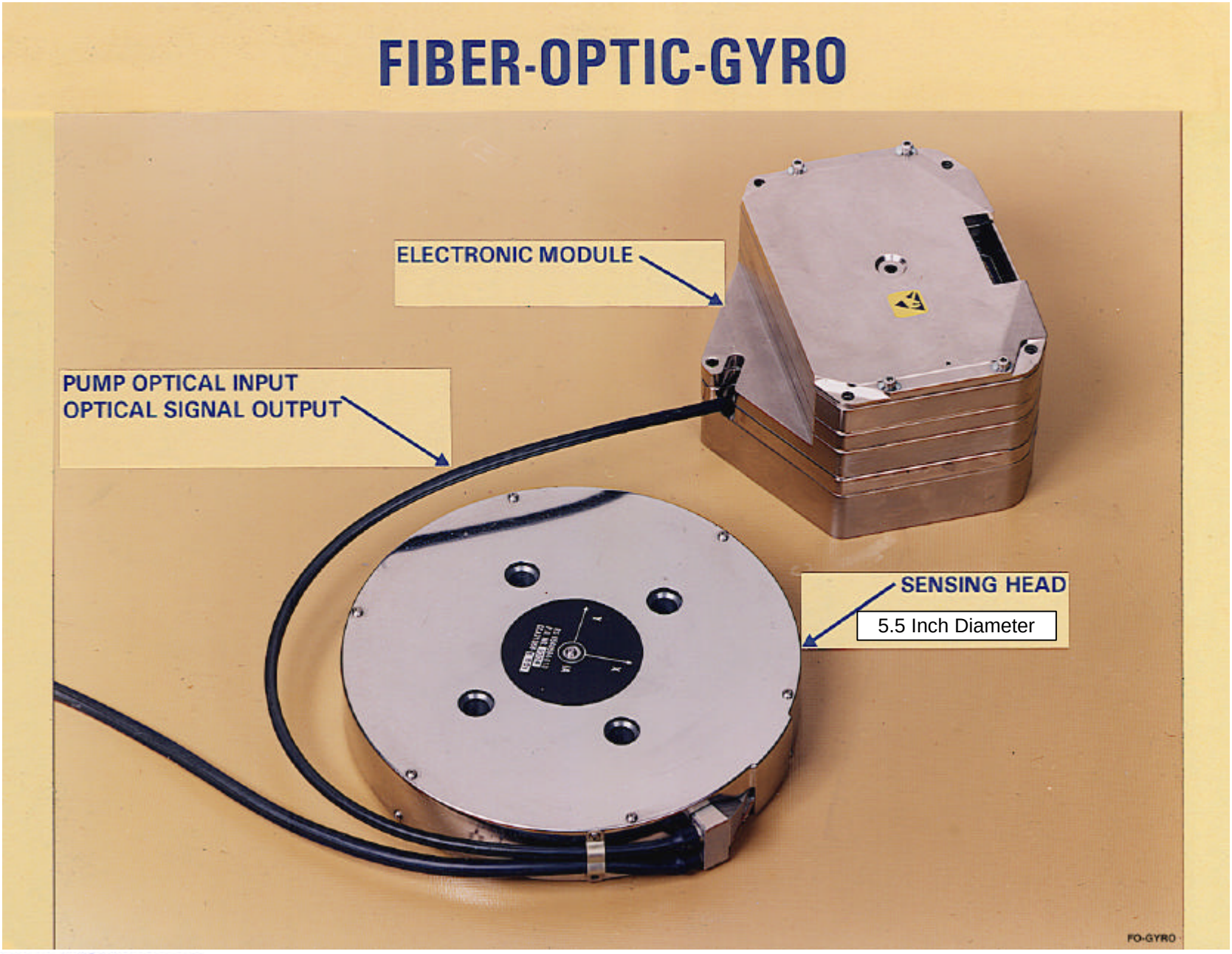
FIBER-OPTIC-GYRO



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POINTING GRADE FIBER-OPTIC-GYRO

- **Pointing Grade Fiber-Optic-Gyro Qualified for Space Application**
- **Currently in Production**
- **Radiation Hardened**
- **Class S Pedigree**
- **No Moving Parts, No High Voltage**
- **15 Year Life**

POINTING GRADE FIBER-OPTIC-GYRO

SCALE FACTOR STABILITY (PPM)	POWER SPECTRAL DENSITY (DEG/HR, 0 → 20 Hz)	BIAS STABILITY (DEG/HR)	ANGLE RANDOM WALK (μDEG/√HR)
<1	0.10	0.0003	150

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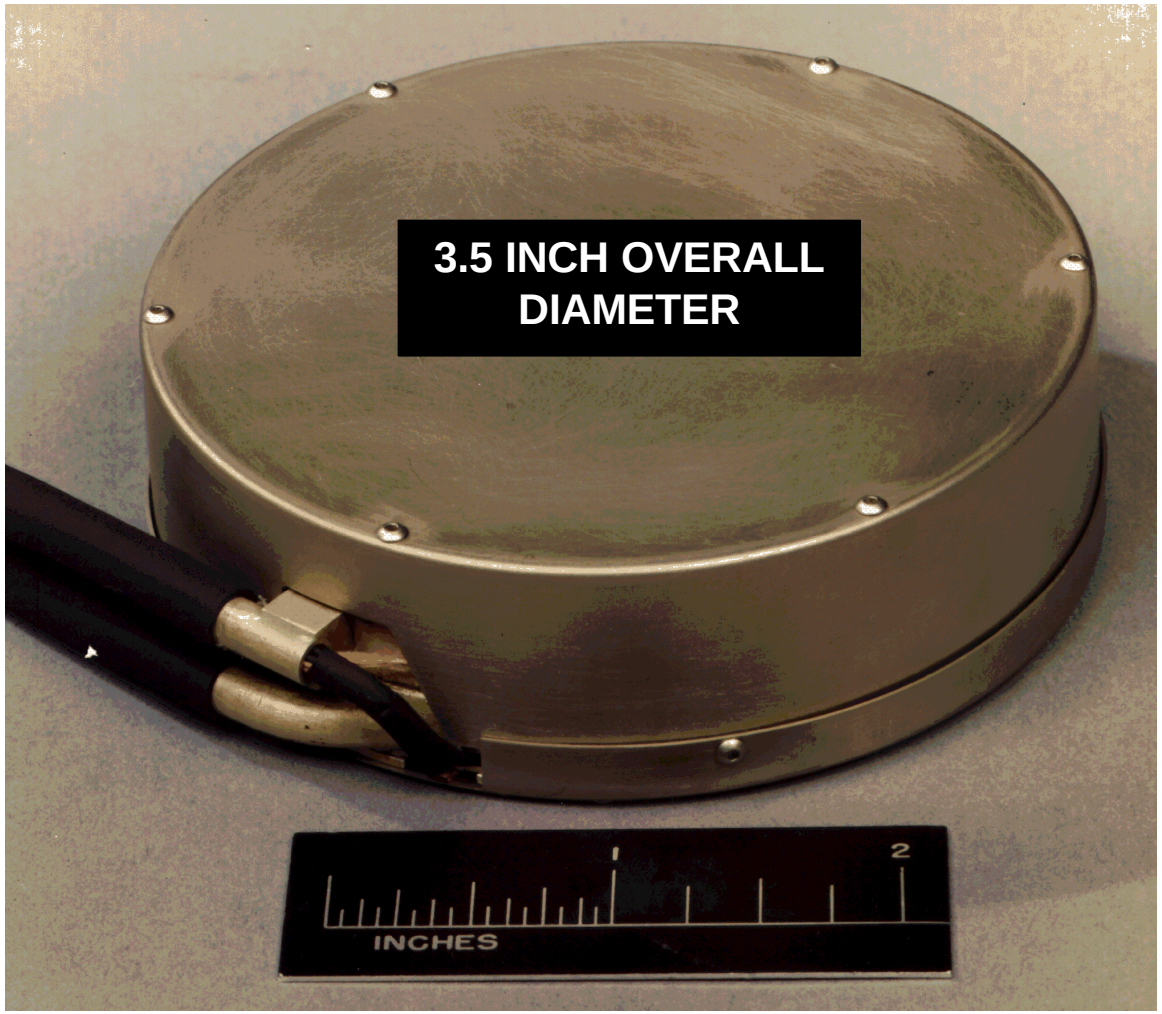
HIGH PERFORMANCE REDUCED SIZE FIBER OPTIC GYRO



- 4100 METERS PM SENSING FIBER
- AVERAGE WINDING DIAMETER = 2.5 INCHES
- ANGLE RANDOM WALK = $180\mu^0/\sqrt{HR}$

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NGST FOG APPROACH FOR ATTITUDE CONTROL

- **RMS Noise = $[(Q/(T_S\sqrt{6}))^2 + (ARW*60/\sqrt{T_S})^2]^{1/2}$**

- **Design Goals to Achieve HST PSD Requirement**
  - **Higher Power, Lower Noise Light Source**
    - 100 Milliwatt Super-Fluorescent-Fiber Light Source
    - Random Intensity Noise (RIN) **< -130 dB/Hz**
  - **4500 Meters, Polarization-Maintaining Sensing Fiber**
  - **Common Mode Noise Subtraction**

- **Performance Prediction**
  - **PSD = 0.02 Deg/Hr (0 $\rightarrow$ 20 Hz)**
  - **Angle Random Walk < 25 μDeg/$\sqrt{}$Hr**

AlliedSignal Committed To Pointing Grade FOG Market

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